



PLANT IMMIGRANTS.

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Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is largely made up from notes received from agricultural explorers, foreign correspondents, cooperators, and others, relative to the more important plants which have recently been received by the Office of Foreign Seed and Plant Introduction of the Department of Agriculture; in it are also contained accounts of the behavior in America of plants previously introduced. Descriptions appearing here are revised and published later in the Inventory of Seeds and Plants Imported.

Applications from experimenters for plants or seeds described in these pages may be made to this Office at any time. As they are received the requests are placed on file and when the material is ready for the use of experimenters it is sent to those who seem best situated and best prepared to care for it. The plants or seeds here described (except such as are distributed direct or are turned over to specialists in the Department who are working on investigational problems) are propagated at our Plant Introduction Field Stations; and when ready to be distributed are listed in our annual check lists, copies of which are sent to experimenters in the late fall. It is not necessary, however, to await the receipt of these lists should one desire to apply for plants which are described herein.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant breeders and experimenters. Every effort will be made to fill specific requests for experimental quantities of new or rare foreign seeds or plants.

David Fairchild,
Agricultural Explorer in Charge

*Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.*

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Alpinia sp. (Zinziberaceae), 49443. From Chama, Alta Verapaz, Guatemala. Seeds collected by Mr. Wilson Popenoe, agricultural explorer. "No. 282a. A plant resembling *Alpinia nutans* in foliage, and producing close to the ground large numbers of bright red fruits about an inch long, containing small hard seeds surrounded by a mucilaginous pulp, much used by the Kekchi Indians as an ingredient of soups and stews. Kekchi name, 'tzih.'" (Popenoe.)

Amygdalus davidiana (Amygdalaceae), 49409. **Peach.** From Sacaton, Arizona. Seeds presented by Mr. S. H. Hastings, director, Agricultural Experiment Station, through Prof. S. C. Mason, Bureau of Plant Industry. "One of the trees of *Amygdalus davidiana* differed so strikingly from the others that I made special note of it. The top was more round and open; the branches thicker, more rigid, and the small twigs thicker and shorter, and decidedly less willowy than in the ordinary type. The leaves were broader than usual, less acuminate, and with coarser marginal serrations. The fruits were unusually large with flesh unusually thick and soft and of a more downy appearance than those of the usual type." (Mason.)

Ananas sativus (Bromeliaceae), 49370. **Pineapple.** From Tucuru, Alta Verapaz, Guatemala. Suckers collected by Mr. Wilson Popenoe, agricultural explorer. "No. 266. A choice variety of pineapple from Tucuru, at an altitude of about 3,200 feet. It is known to the few Americans in this region as the 'sugar loaf pineapple' because of its sweetness. It is described by R. W. Hempstead, through whose courtesy I have obtained these suckers, as large, broadly oval, with white, very juicy, sweet-flavored flesh." (Popenoe.)

Annona scleroderma (Annonaceae), 49371. From Tucuru, Alta Verapaz, Guatemala. Seeds collected by Mr. Wilson Popenoe, agricultural explorer. "No. 249a. 'Posh' (Kekchi); Spanish orthography 'pox'; sometimes called in English, 'hard-shelled custard-apple.' A rare species of *Annona* from Chama, on the Rio Chisoy, altitude 950 feet. In size of tree and habit of growth this species resembles *Annona reticulata*. In foliage, however, it is quite distinct. The leaves are oblong to oblong-lanceolate, 6 to 9 inches long, 2 to 3 inches broad, shortly acuminate, coriaceous, deep green and almost glossy above, paler beneath.

"The fruits, which are borne on stout stalks about an inch long, are broadly heart shaped to round and up to 4 inches in diameter. The surface, which is dull gray-green, differs in character from that of most other Annonas; it is divided by prominent ridges into irregularly pentagonal areas. The skin or outer covering is nearly a quarter of an inch thick, and coarsely granular in texture. It forms a brittle shell which effectively protects the flesh and makes it possible for the ripe fruit to be handled roughly without injury. The latter, which is snow-white and divided into loosely cohering segments each containing a seed the size of a bean, is of remarkably pleasant flavor, suggesting that of a sugar-apple (*A. squamosa*) with a dash of lemon. Many Annonas are heavily sweet or mawkish, but the 'posh' is not. It has sufficient acidity (more than the cherimoya) to give it sprightliness, and it never cloyes the palate.

"The trees which I have seen at Chama are more productive than the average cherimoya. The species may well be compared to *A. squamosa* in fruiting habit. Abortive fruits, such as many of those borne by most cherimoya trees, are rarely produced, but there is considerable variation in the size; the average is about 3 inches in diameter. This species evidently belongs to the tropical lowlands, hence in the United States it is likely to succeed only in southern Florida." (Popenoe.)

For previous introduction see S. P. I. No. 40835, Plant Immigrants No. 110, June, 1915, p. 892.

Chaetochloa paniculifera (Poaceae), 49372. Grass. From Tucuru, Alta Verapaz, Guatemala. Seeds collected by Mr. Wilson Popenoe, agricultural explorer. "No. 258a. 'Hotz kor' (Kekchi). Collected near Chama. This plant is found commonly throughout the Alta Verapaz, where it is considered one of the best forage grasses. It is thought to be more nourishing than most other grasses, and both horses and cattle eat it readily in spite of the fact that the leaves are covered with somewhat coarse hairs which it might be expected would prove disagreeable to animals.

"'Hotz kor' never forms pastures of solid stands over large areas, but usually grows on slopes or among scrub where it forms scattered clumps, sending up leaves to a height of 4 to 6 feet and flower stalks sometimes 6 or 7 feet, above the ground. It is a perennial, and I am told by R. W. Hempstead that it will



PARENT TREE OF THE FUERTE AVOCADO.

(*Persea americana* Mill. See S. P. I. No. 46984.)

During the last five years the Fuerte avocado, originally introduced into the United States in 1911, from Atlixco, Puebla, Mexico, has come to the front as one of the most promising commercial varieties in this country. It is remarkable in that it is, apparently, a hybrid between the Guatemalan and Mexican races. This illustration shows the parent seedling tree growing in the garden of Alejandro Le Blanc in Atlixco. The tree is believed to be about 60 years old, and it produces about 500 fruits annually. (Photographed by Wilson Popenoe, Atlixco, State of Puebla, Mexico, December 22, 1918; P17626FS.)



IN THE AVOCADO GROVES OF QUERETARO.

(*Persea americana* Mill. See S. P. I. No. 46984.)

The canyada, a narrow valley in the suburbs of the city of Queretaro, is one of the greatest avocado regions of Mexico. For a length of 2 miles it is completely filled with avocado trees. Many of them are extremely old and large, but even the oldest produce fruit regularly. The cultural conditions under which they exist can be seen in this illustration. Water is turned over the soil every two or three weeks from small irrigating canals which run through the valley. The trees are all seedlings of the hardy Mexican race. (Photographed by Wilson Popenoe, Queretaro, Mexico, July 23, 1918; P17532FS.)

stand four cuttings a year. It seems particularly adapted to moist regions, and for this reason is recommended for trial in the Everglades region of Florida." (Popenoe.)

Festuca hookeriana (Poaceae), 49368. Grass. From Sydney, New South Wales. Seeds presented by Mr. George Valder, undersecretary and director, Department of Agriculture. A stout perennial grass, 2 to 4 feet in height, indigenous to New South Wales, Victoria, and Tasmania. It has flat, rather long leaves, very loose panicles up to a foot in length, and rigid flowering glumes. It stands mowing and pasturing well, and is relished by stock. (Adapted from Maiden, Useful Native Plants of Australia, p. 107; and Bentham, Flora Australiensis, vol. 7, p. 656.)

Gladiolus malangensis (Iridaceae), 49369. Gladiolus. From Ochileso, Angola. Bulbs presented by Mr. H. A. Neipp, American Mission. A West African gladiolus from 1 to 2 feet in height, with 3 or 4 erect, rigid, linear leaves and a simple or branched inflorescence. The deep red flowers are borne in loose spikes 4 to 6 inches long. (Adapted from Bulletin de l'Herbier Boissier, 2d ser., vol. 1, p. 867.)

Grevillea lavandulacea (Proteaceae), 49365. From Blackwood, South Australia. Seeds presented by Mr. Edwin Ashby, "Wittunga." "A native of South Australia, where it grows from a foot to 18 inches high on a sandy or clayey subsoil, but it seems to prefer broken, rocky soil (quartzite). It does very well on rockeries and should be treated as a rock plant (dwarf, hard-wooded shrub). It produces a mass of pink flowers from the beginning of our winter until late spring. It should do well in California, where it will be an acquisition to those who have rock gardens." (Ashby.)

Persea donnell-smithii (Lauraceae), 49383. From Tucuru, Alta Verapaz, Guatemala. Seeds collected by Mr. Wilson Popenoe, agricultural explorer. "No. 248a. 'Oh-mash' (Kekchi, monkey avocado), a wild species of *Persea* found in the valley of Tactic (where these seeds were obtained) and abundantly on the mountains between Tactic and Coban, principally in open places.

"This is a slender tree up to 40 feet in height (commonly about 25 feet), with large, oblong-obovate

leaves reddish-pubescent beneath, and small terminal panicles of black fruits the size and shape of peas. While its fruit is not edible nor useful in any way, the species is of interest as a relative of the avocado, and may have value as a stock for the latter, especially for wet lands. Its degree of frost-resistance is unknown, but the fact is that it occurs in the zone of the Guatemalan avocado indicates that it will probably be as hardy as the latter, and maybe even hardier." (Popenoe.)

Phyllostachys mitis (Poaceae), 49357. **Bamboo.** From Nice, France. Rhizomes presented by Dr. A. Robertson Proschowsky. "The tallest species of the bamboos commonly cultivated here; the culms usually attain a height of 10 to 12 meters (33 to 39 feet), rarely more. It is an exceedingly hardy species, and a very useful plant, the culms being strong and quite straight. Prof. Trabut, of Algiers, expressed the opinion that this bamboo is most useful in Algeria." (Robertson Proschowsky.)

Randia aculeata. (Rubiaceae), 49386. From Purulha, Baja Verapaz, Guatemala. Seeds collected by Mr. Wilson Popenoe, agricultural explorer. "No. 269a. A shrub, strongly resembling *Buxus*, which I have seen only in the vicinity of Purulha, Baja Verapaz. It grows in the edge of the forest, occasionally in the open, seems to thrive on abundant moisture. It is interesting because of its formal appearance and symmetrical growth. It should make an excellent hedge plant, and for specimen plants in a formal garden should be very attractive. It reaches about 10 feet in height, and its slender branches are clothed with small leaves arranged in clusters. The round fruits, which are white when ripe and about half an inch in diameter, increase the ornamental appearance of the plants." (Popenoe.)

Sorbus torminalis (Malaceae), 49432. From Borde Hill, Cuckfield, Sussex, England. Plants presented by Col. Stephensen R. Clark. A fine large tree, native to southern and central Europe. The dark green leaves, rather variable in shape and size, turn yellow and red in autumn, and the white flowers are borne in June in rather lax corymbs about 4 inches in diameter. The reddish yellow, roundish fruits are sometimes eaten when very ripe. (Adapted from Hempel and Wilhelm, *Bäume und Sträucher*, vol. 3, p. 81.)

Trigonella suavisissima (Fabaceae), 49124. From Sydney, New South Wales. Seeds presented by Mr. J. H. Maiden, director, Botanic Gardens, through Mr. A. J. Pieters, Bureau of Plant Industry. This cloverlike plant, called "Darling clover" in Australia, where it is native, has fragrant stems and foliage, and in favorable locations is perennial, becoming 3 feet or more in height. When grown on rich black soils subject to periodic inundations, it produces a large amount of nutritious herbage, of which stock are particularly fond, and on which they fatten. It provides good feed in late winter and early spring, hence it is a valuable addition to pastures. Sir Thomas Mitchell wrote of this plant, which he called "Australian shamrock": "The perfume of this herb, its freshness and flavor, induced me to try it as a vegetable. and we found it delicious, and tender as spinach." The perfume is due to the presence of coumarin. If cut when in flower, and properly cured, it makes good hay. (Adapted from Kew, Bulletin of Miscellaneous Information, 1909, p. 12.)

Notes from Correspondents.

A letter received August 26, 1918, from Mr. B. H. Hunnicutt, Lavras, Minas, Brazil, contains the following interesting account of the macauba palm.

"*Acrocomia seleroearpa*, also called 'macaiba,' 'macaja,' 'macajuba e coqueiro de catarrho,' is a palm 10 to 15 meters [33 to 39 ft.] in height and is found over quite an extensive district reaching from the state of Maranhao to the more southern states of Minas, Rio de Janeiro, and Espirito Santo. The trees frequently form large groups in which they can be counted by thousands. It grows in this way in the central and northern parts of Minas, especially in the valley of the River das Velhas and the Jequitinhonha River and their tributaries. It is calculated that the district in this state which comprises within its limits the villages of Lapa, Jaboticatuba, Taquarassu, Uniao, and Cipo e Santa Luzia, has spontaneous growth of more than a million of these valuable palm trees.

"It is an ornamental palm on account of its elegant form, and for this reason it is cultivated in many of the cities of Brazil including the capital of the Republic. It furnishes excellent fiber, good wood for many mechanical and artistic uses, the much appreciated palmetto, and acidulous pulpy fruits which are edible and pleasant to the taste.

"The bony or ivorylike coating of the seed is utilized by the jewelers of the city of Diamantina, who, with great taste and skill, from this substance make buttons, rings, watch chains, and other ornaments. The greatest industrial value of the seed, however, is found in the production of oil.

"The kernel which is covered with a thick shell, contains about 60 per cent of excellent oil which is as well suited for the finer products of industry as for table oil. The pulp, or the substance which lies between the epicarp and the endocarp, by reason of its greater volume, predominates in the nuts and is the part of the fruit which produces the largest yield of oil, and, naturally, it has a more extensive use. This oil, however, is greatly inferior in quality to that obtained from the kernel. It may be purified, however, and rendered quite useful. On some of the fazendas [plantations] in Minas, a kind of oil is manufactured from the macauba palm, by a very primitive process, but the product thus obtained is offensive in appearance and has a very disagreeable odor due to the impurities. It is sold generally for a few cents a liter.

"In this small industry only the pulp which has passed through a process of fermentation is used. The fruits are placed together in holes made in the ground and covered with a layer of straw. They are kept in these holes for ten or twelve days and are watered constantly. After the hull has been removed, the pulp is partially crushed in a kind of mill leaving uninjured the innermost kernel which contains the finest oil. By this process the yield is scarcely more than 5 to 8 per cent. There is, however, in the city of Bello Horizonte, a factory which makes use of the entire nut, obtaining in this way a yield of 15 to 17 per cent and a product of much better quality.

"By the common process, the oil obtained is utilized in making laundry soap, and this may be greatly improved by the addition of a small quantity of resin which gives to the soap the proper consistency and neutralizes the disagreeable odor. Properly handled, this oil may be used to advantage in the manufacture of fine toilet soaps.

"Each tree produces about 80 liters [85 qts.] of nuts a year, and, according to experiment, an acre of ground planted in macauba palms would give a total yield of \$100.00 not counting the residue which may be used as a combustible or as a fertilizer." (Brazil, Suas Riquezas Naturaes, Suas Industrias, vol. 1, pt. 2, p. 198.)

During the war, the experts for the Council for National Defence found the hard shells of the macauba nuts very satisfactory in the production of charcoal for use in gas masks. Seeds of *A. sclerocarpa* have been introduced into the United States several times by this Office; the last shipment was from Lavras, Minas, Brazil, in 1914, under S. P. I. No. 37382.

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BUREAU OF PLANT INDUSTRY
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